REMARKS/ARGUMENTS

In the August 20, 2010 Final rejection, the Examiner continued the rejection of claims 10 and 12 under 35 U.S.C. § 112, first paragraph, as allegedly not enabled, asserting that the amount of carbonaceous material and binder is *critical* to determining the amount of gas generated and therefore, must be present in the claims. Applicant respectfully traverses.

The test of enablement "is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation." *United States v. Teletronics, Inc.*, 857 F.2d 778, 785 (Fed. Cir. 1988) (*see also* MPEP § 2164.08 (stating that the test of enablement is to determine whether "the scope of enablement provided to one skilled in the art by the disclosure is commensurate with the scope of protection sought by the claims") (citing *AK Steel Corp. v. Sollac*, 344, F.3d 1234, 1244 (Fed. Cir. 2003); *In re Moore*, 439 F.2d 1232, 1236 (CCPA 1971)); MPEP § 2154.01 (stating that the disclosure is enabling "[a]s long as the specification discloses at least one method for making and using the claimed invention that bears a reasonable correlation to the entire scope of the claim"). In *United States v. Teletronics, Inc.*, the Federal Circuit evaluated the claims of a patent directed to a system for expediting the healing of bone fractures, using, in part, a constant current "being a selected value within a predetermined microampere range so as to promote bone formation." 857 F.2d 778, 780. Despite arguments that the claim was not enabled because no specific constant current range was claimed, and thus that the claim was allegedly not commensurate in scope with the claims, the Federal circuit held that because "one embodiment is . . . disclosed in the specification, along with the general manner in which its current range was ascertained, we are convinced that other permutations of the invention could be practiced by those skilled in the art without undue experimentation." *Teletronics, Inc.*, 857 F.2d 778, 786; *see also In re Wands*, 858 F.2d 731, 735 (Fed. Cir. 1988) (holding that the disclosure of one antibody is enabling for applicant's claim to a generic class of antibodies because those of skill in the art, using the state of the art and applicant's disclosure, could produce other antibodies within the generic class without undue experimentation). Here, the specification includes detailed descriptions as to the

methods used to make the present invention. *E.g.*, Examples 1-4. Claims 10 and 12 recite a negative active material *consisting essentially of* a carbonaceous material and an aqueous binder, the aqueous binder *consisting essentially of* a butadiene-based rubber and a cellulose-based compound. Each of Examples 1 through 4 include a negative active material bearing a reasonable correlation to the scope of claims 10 and 12, as each of these Examples includes a negative active material including graphite, carboxymethyl cellulose and styrene-butadiene rubber. Also, Examples 1 through 4 provide at least two different negative active material compositions (i.e., Examples 1 through 3 include 96g graphite and 2g each of carboxymethyl cellulose and styrene-butadiene rubber, and Example 4 includes 96g graphite and 1g each of carboxymethyl cellulose and styrene-butadiene rubber). Just as in *Teletronics* and *In re Wands*, here, those of skill in the art could use Applicant's disclosure, including the exemplary embodiments, as a starting point, and could perform routine experimentation on a variety of factors, including the amount of binder, to determine their own preferred amount of each component and their own preferred conditions. Indeed, in *Teletronics* and *In re Wands* the Federal Circuit held that the disclosure of only one embodiment combined with the remainder of the disclosure and the skill of those having ordinary skill in the art was enabling of a broader genus claim. Aside from a general statement that the amount of binder affects gas generation of an electrode, which does not appear to have any bearing on the issue of enablement, the Examiner has provided no evidence as to why the specification does not enable one skilled in the art to practice the invention as broadly as it is claimed. In particular, the Examiner has given no reason or rationale why determining an optimum amount of binder in view of the specification would require anything more than routine experimentation by those of ordinary skill in the art. Accordingly, Applicant submits that this disclosure sufficiently supports the claims such that those of skill in the art, reading Applicant's specification, would be able to make and use the claimed invention without undue experimentation.

The Examiner also appears to suggest that because the amount of binder in an electrode of the present invention is allegedly critical, the amount of binder must be included in the claims. The MPEP states that "an enablement rejection based on the grounds that a disclosed critical

limitation is missing from a claim *should be made only when the language of the specification makes it clear that the limitation is critical for the invention to function as intended*," and that "[b]road language in the disclosure, including the abstract, omitting an allegedly critical feature, tends to rebut the argument of criticality." MPEP § 2164.08(c). While the Examiner points to page 4 to support the assertion that the present specification states that the amount binder is critical to the amount of gas generated, Applicant can find no such statement. That the specification may suggest that the amount of binder has an effect on the amount of gas generated is not equivalent to a statement that the binder amount is "critical." Furthermore, the disclosure, including the abstract, omits the allegedly critical feature of the amount of binder. Also, while the specification may suggest that certain amounts of the binder are preferred, "[f]eatures which are merely preferred are not to be considered critical." MPEP § 2164.08(c) (emphasis added). As such, the amounts of carbonaceous material and aqueous binder are not critical elements, and Applicant respectfully requests withdrawal of this rejection.

Additionally, the Examiner continued the rejection of claims 10 and 12 under 35 U.S.C. § 112, second paragraph, as allegedly indefinite. In making this rejection, the Examiner argues that the metes and bounds of the claimed products are unclear because "[i]t is unclear if the charging is a required limitation of the final product so that the final product is a charged lithium battery or if the charging process is a means of evaluating the negative electrode product and therefore not actually part of the claimed product." Final rejection, page 3. As noted in several of Applicant's previous responses and appeal brief, the feature discussed by the Examiner is a *property* of the electrode or a battery comprising the electrode. In particular, the claims recite that during charging (or initial charging), a total amount of gas is generated, the gas having a CO content of 30 volume % or less and a H_2 content of 0.2 volume % or less. This entire clause is the limitation. However, in the rejection, the Examiner attempts to separate a portion of the claimed property (charging) into its own limitation - this is improper. As recognized by the Board of Patent Appeals and Interferences, this entire limitation is not a product-by-process limitation, but rather, a property of the electrode or battery. *Ex parte Kim*, Appeal 2009-004565 (BPAI February 26, 2010). The claim recites that the electrode or a battery comprising the

electrode has a particular property, and that the property, a particular gas generation, may be measured when the electrode or battery is charged to determine whether the property is present. This limitation, regarding a property of the electrode or battery, is definite, and would be clearly understood by those of ordinary skill in the art.

Turning to the prior art rejections, claims 10 and 12 were rejected under 35 U.S.C. § 103(a) as obvious over Dasgupta et al. (U.S. 2003/0152835) in view of Takami (U.S. 5,753,387). In making this rejection, the Examiner admits that Dasgupta fails to disclose an aqueous binder consisting essentially of a butadiene-based rubber and a cellulose-based compound, but relies on Takami to remedy this deficiency. However, neither Dasgupta nor Takami teach or suggest an electrode or battery in which during charging (or initial charging) of the rechargeable lithium battery, a total amount of gas is generated, the gas having a CO content of 30 volume % or less and a H_2 content of 0.2 volume % or less.

Despite the fact that neither Dasgupta nor Takami teach or suggest that the electrodes or batteries disclosed therein have the claimed properties, the Examiner continues to assert that because the combined references allegedly teach the "same electrode and battery elements as claimed and the same vacuum drying process as disclosed," such a property would be inherent in the combined electrodes or batteries. Office action, page 6. To establish that a result or characteristic is inherently present, the missing descriptive matter must be "*necessarily* present in the thing described in the reference." *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999) (quoting *Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1268, 20 U.S.P.Q.2d 1746, 1749 (Fed. Cir. 1991)) ("*Monsanto*"). Here, the negative electrode and battery of Dasgupta and Takami do not *necessarily* generate the recited amount of gas. Furthermore, contrary to the Examiner's conclusion that Dasgupta discloses "the same vacuum drying process as disclosed," the two processes are notably different. Dasgupta teaches that a portion of the carbon fibers may be vacuum dried at a temperature of from 40 to 140 °C for 2 to 8 hours prior to mixing with the remainder of the carbon and binder and pasting the mixture on a current collector. Dasgupta, paragraphs 0015 and 0027. In the alternative, Dasgupta teaches that the carbon, binder, and lithium ion solution may be combined, heat and vacuum treated at from 45 to 80 °C for 2 to 8

hours, and then pasted onto a current collector. Dasgupta, paragraphs 0016 and 0028. Dasgupta cautions that when the carbon, binder, and lithium ion solution are combined prior to heat and vacuum treatment, the temperature should not exceed 80 °C to avoid damage to the constituents. Dasgupta, paragraph 0028. In an embodiment of the present application, the process of vacuum drying is notably different. As described in the specification, in one embodiment, the negative electrode precursor (including the carbon and binder) are vacuum dried at 80 - 200 °C, preferably 90 to 150 °C, under a pressure of 10 torr or less for from 1 to 72 hours. Specification, page 3, lines 12-18. Furthermore, the negative electrode precursor is pasted onto the current collector prior to vacuum drying the negative electrode precursor. Specification, page 4, line 33- page 5, line 2. The temperature difference, time difference, and procedural difference between the method of Dasgupta (in which the mixture is pasted after vacuum drying) and the embodiment of the present invention (in which the mixture is pasted prior to vacuum drying) could result in differences in the end product such that the products produce different amounts of gasses upon charging. Similarly, as Dasgupta fails to disclose the pressure under which the vacuum drying occurs, differences in the amount of vacuum may also result in differences in the end product, such that the products produce different amounts of gasses upon charging. Accordingly, as the electrodes or batteries of Dasgupta and Takami cannot be said to *necessarily* generate the recited amount of gas, claims 10 and 12 are allowable over the cited references.

Furthermore, vacuum dried electrodes of the present invention exhibit surprising and unexpected results over the closest prior art of record, Takami. In particular, in Examples 1 and 2, the negative electrodes were vacuum-dried, and in Comparative Example 1, the negative electrode was not vacuum-dried, and thus, is similar to the example disclosed at col. 17, lines 49-54 of Takami. Each of the negative electrodes in Comparative Example 1 and Examples 1 and 2 had the same chemical composition, i.e., each electrode included 96g graphite, 2g carboxymethyl cellulose and 2g styrene-butadiene rubber. Despite the identical chemical composition, the electrodes of Examples 1 and 2 and Comparative Example 1 had very different gas generation profiles. Specifically, the electrodes of Examples 1 and 2 showed markedly reduced CO and H_2 generation. As the electrode of Takami is made by a process similar to that of Comparative

Example 1, it appears that the electrode of Takami *does not* generate the recited amount of gas. This drastic reduction in gas production would be unexpected and surprising to those having skill in the art, as the three examples each include the same materials. Furthermore, the gas generation properties are unexpected in view of Dasgupta and Takami, as neither reference mentions or appreciates any benefit in the gas generation properties from the vacuum drying procedure or any other feature. Given these superior and unexpected results, claims 10 and 12 are further patentably distinguishable over Dasgupta and Takami.

Claims 10 and 12 remain pending in this application. In light of the above remarks, Applicant submits that both of pending claims 10 and 12 are in condition for allowance. Applicant therefore respectfully requests reconsideration and a timely indication of allowance. However, if there are any remaining issues that can be addressed by telephone, Applicant invites the Examiner to contact Applicant's counsel at the number indicated below.

Respectfully submitted,
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